# RZA3UL
# Azure RTOS
# Sample Projects

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# RZ/A3UL Azure RTOS Sample Projects

- **Sample Projects**

| No | Program file | Description |
|---|---|---|
| 1 | filex_demo_sdmmc_rza3_fsp_1.0 | Sample project to check the function of FileX. |
| 2 | guix_demo_usbx_hhid_mouse_rza3_fsp_1.1 | Sample project to check the function of GUIX and USBX. |
| 3 | netx_demo_http_server_rza3_fsp_1.0 | Sample project to check the function of NetX duo. |
| 4 | usbx_demo_hcdc_rza3_fsp_1.0 | Sample project to check the function of USBX HCDC. |
| 5 | usbx_demo_hhid_rza3_fsp_1.0 | Sample project to check the function of USBX HHID. |
| 6 | usbx_demo_hmsc_rza3_fsp_1.0 | Sample project to check the function of USBX HMSC. |
| 7 | usbx_demo_huvc_netx_http_server_rza3_fsp_1.0 | Sample project to check the function of USBX HUVC. |
| 8 | RZA3UL_demo_azure_iot_1.0 | Sample project to check the function of Azure IoT Middleware. |

- **Development Environment**

| | |
|---|---|
| **e² studio** | Version: 2023-04 (23.4.0) *1 |
| **RZ/A FSP** | Version: 2.0.1 |

For more information to set up your development environment, refer to the following document.

➢ Getting Started with RZ/A Flexible Software Package V2.01 (renesas.com)

***1 It does not work with latest version of e² studio (e² studio 2023-07). Please use e² studio 2023-04.**

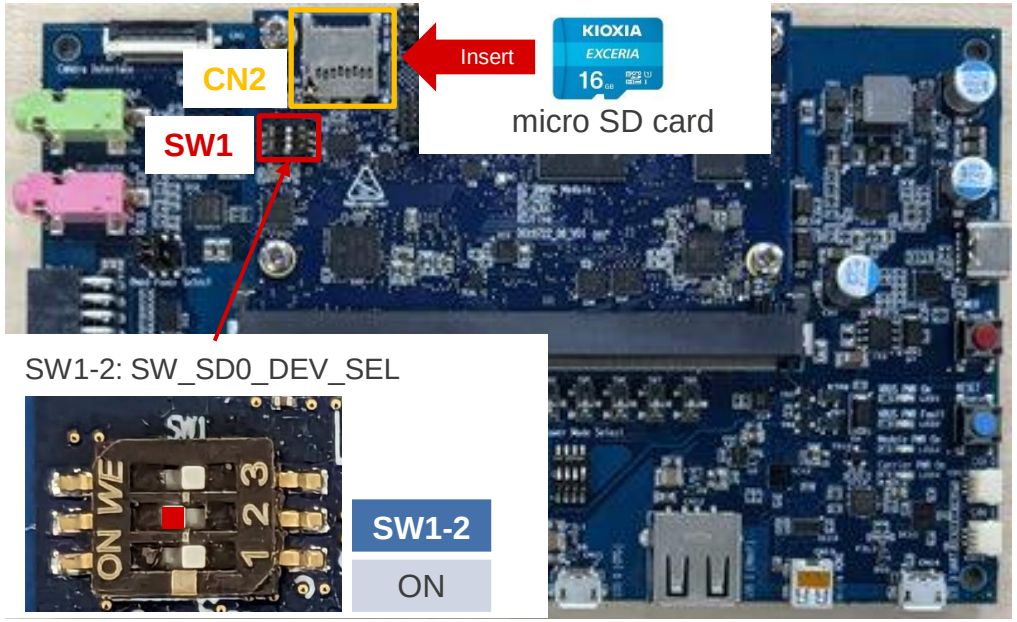
# Sample 1: filex_demo_sdmmc_rza3_fsp

This sample project outputs the status to the console while verifying SD card read/write.

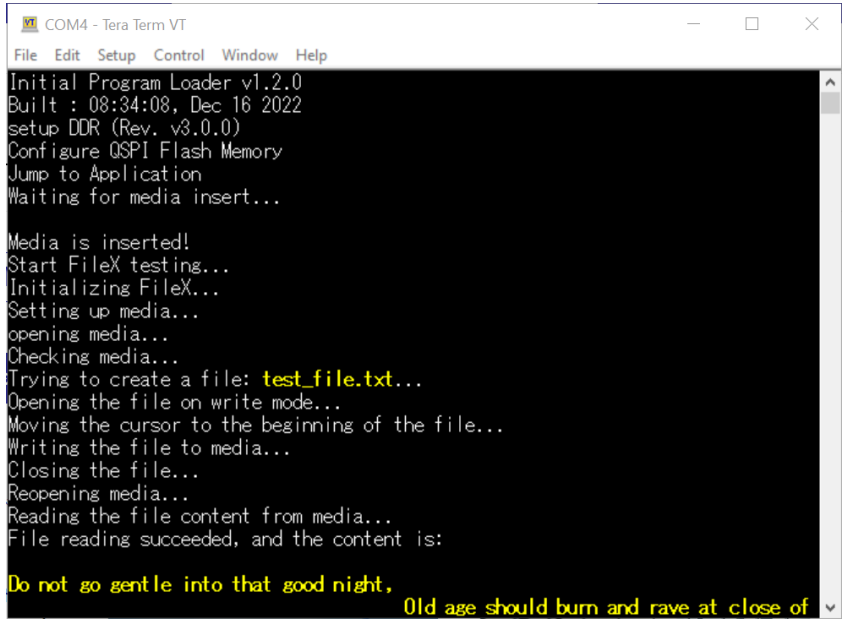
## How to Execute The Sample Project

1. Set the SW1 of the board.
2. Start the terminal software.
3. Download the project and start debugging.
4. Insert SD card into the board.
5. Confirm the following message is displayed on the terminal.

### Board Setting




### Message on Terminal



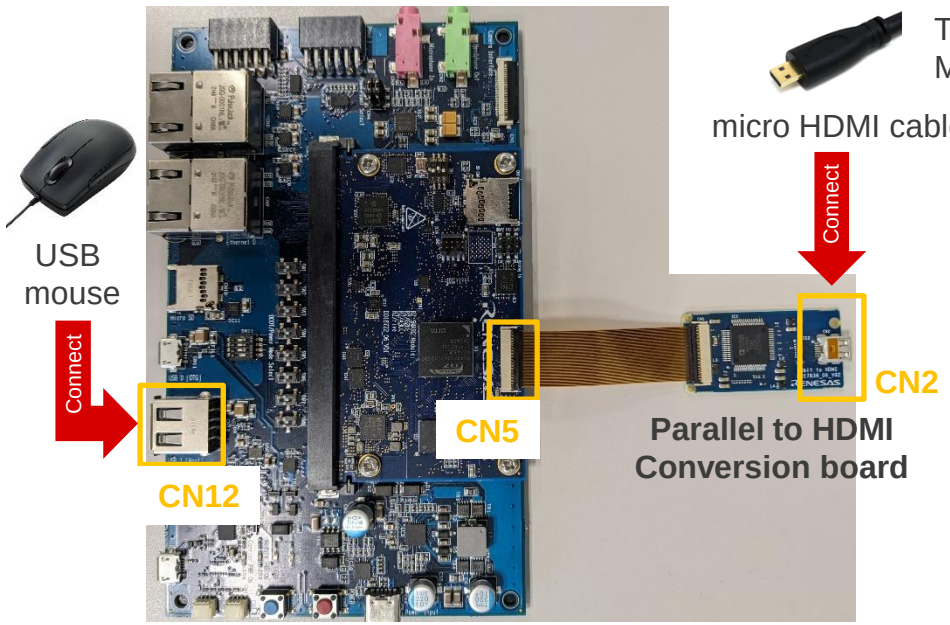
# Sample 2: guix_demo_usbx_hhid_mouse_rza3_fsp

This sample project displays the GUI on the HDMI monitor and can be operated with the USB mouse.

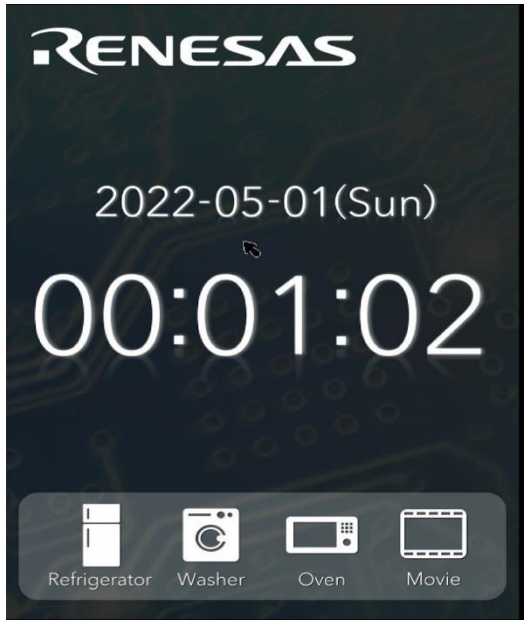
## How to Execute The Sample Project

1. Connect the HDMI monitor to the board via **Parallel to HDMI Conversion board**.
2. Download the project and start debugging.
3. Connect the USB mouse to the board.
4. Confirm that the following screen is displayed on the HDMI monitor.

### Board Setting




### Displayed Screen



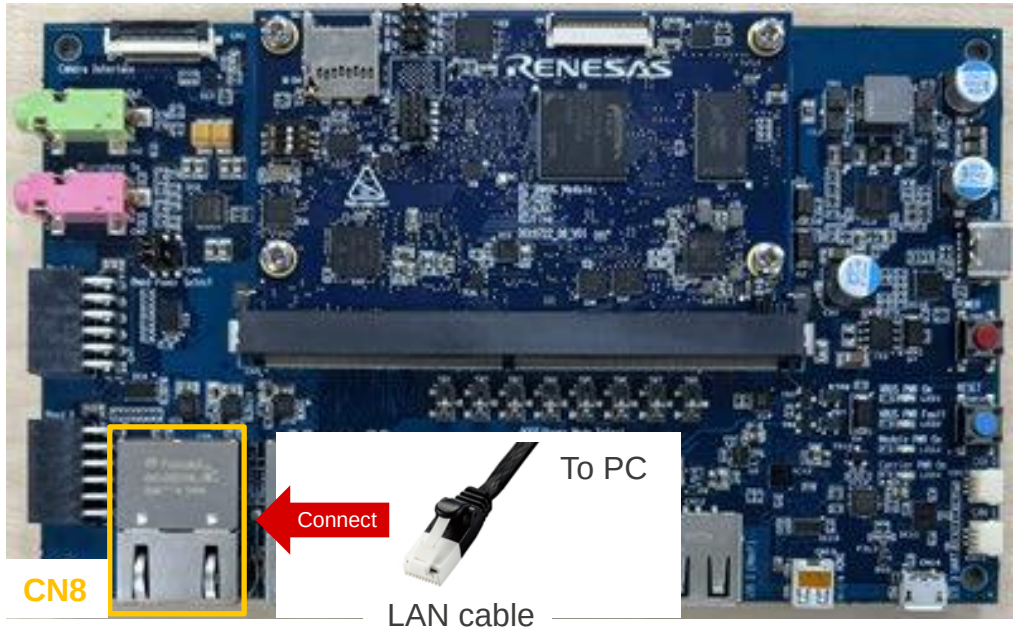
# Sample 3: netx_demo_http_server_rza3_fsp

This sample project works as an HTTP server and responds to HTTP requests from browser.

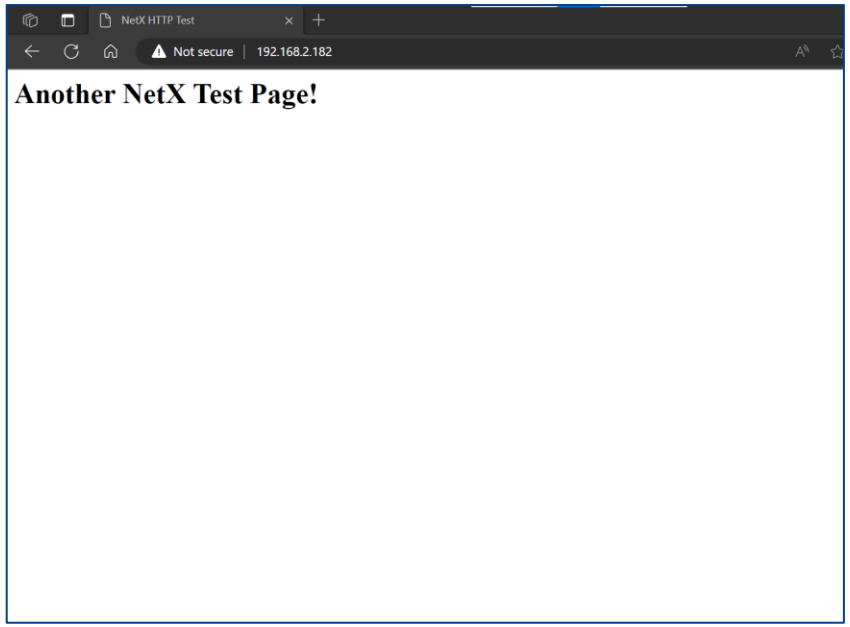
## How to Execute The Sample Project

1. Connect the Ethernet connector of the PC and the board.
2. Configure a static IP address (refer to *)
3. Download the project and start debugging.
4. Access the IP address “192.168.2.182” and confirm that following browser is displayed in the browser.

### Board Setting




### Browser Display



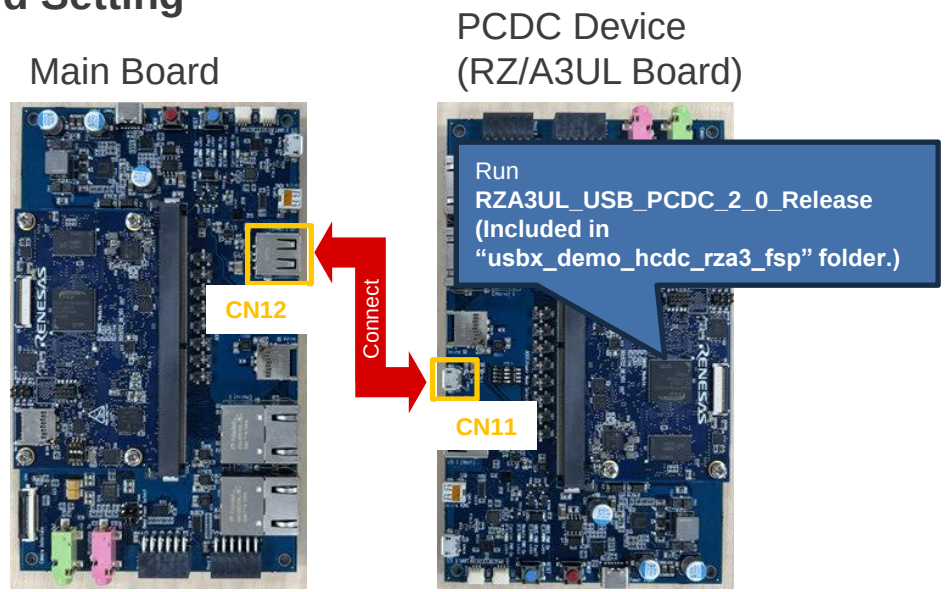
# Sample 4: usbx_demo_hcdc_rza3_fsp

This sample project sends an AT command and displays the response in the log when connect a device that acts as a PCDC.

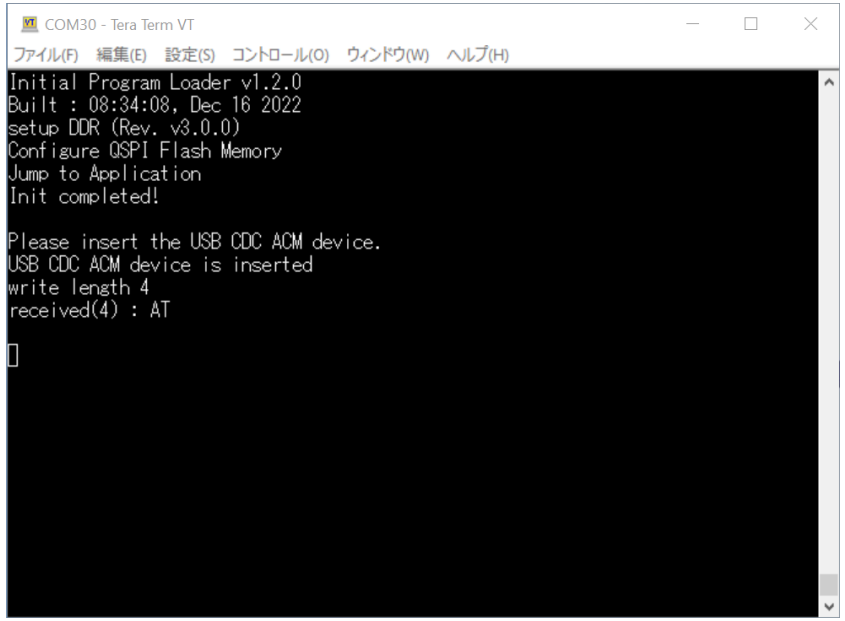
## How to Execute The Sample Project

1. Run **RZA3UL_USB_PCDC_2_0_Release** project on one RZ/A3UL board to act as PCDC device.
2. Start the terminal software.
3. Download the project and start debugging.
4. Connect the PCDC device to the board.
5. Confirm the following message is displayed on the terminal.

## Board Setting




## Message on Terminal



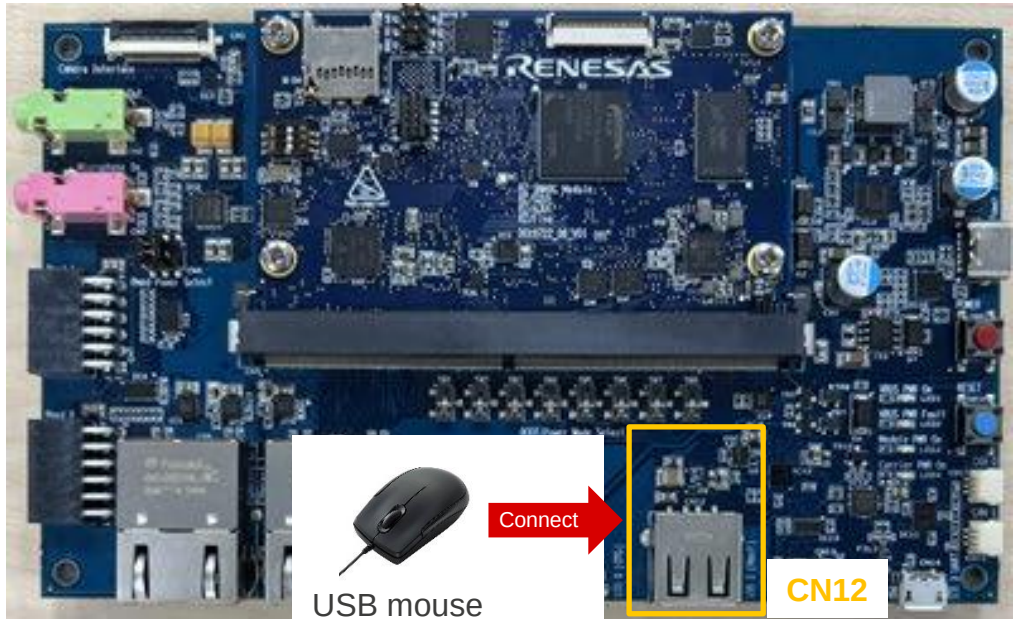
# Sample 5: usbx_demo_hhid_rza3_fsp

This sample project detects the USB mouse and output the mouse position information.

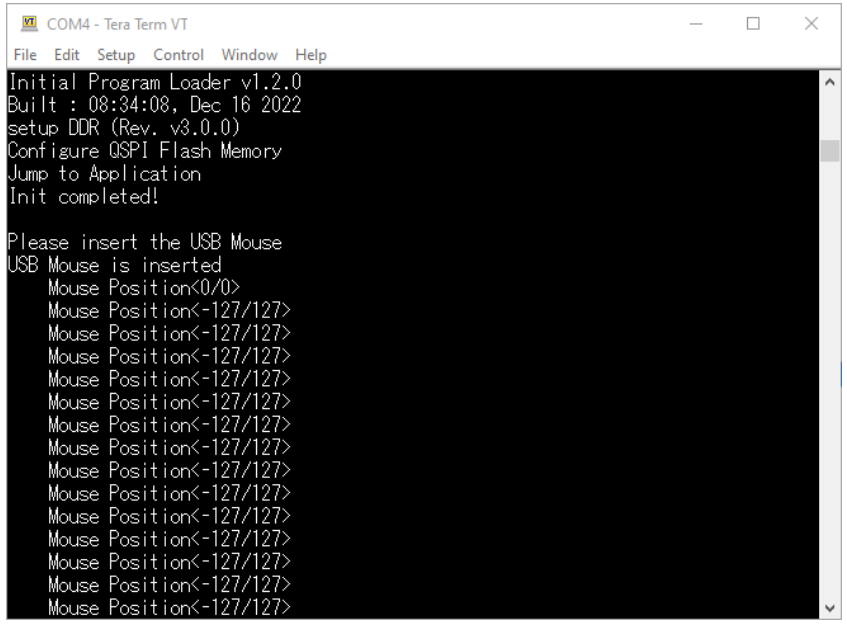
## How to Execute The Sample Project

1. Start the terminal software.
2. Download the project and start debugging.
3. Connect the USB mouse to the board.
4. Confirm the following mouse position information is displayed on the terminal.

### Board Setting




### Message on Terminal



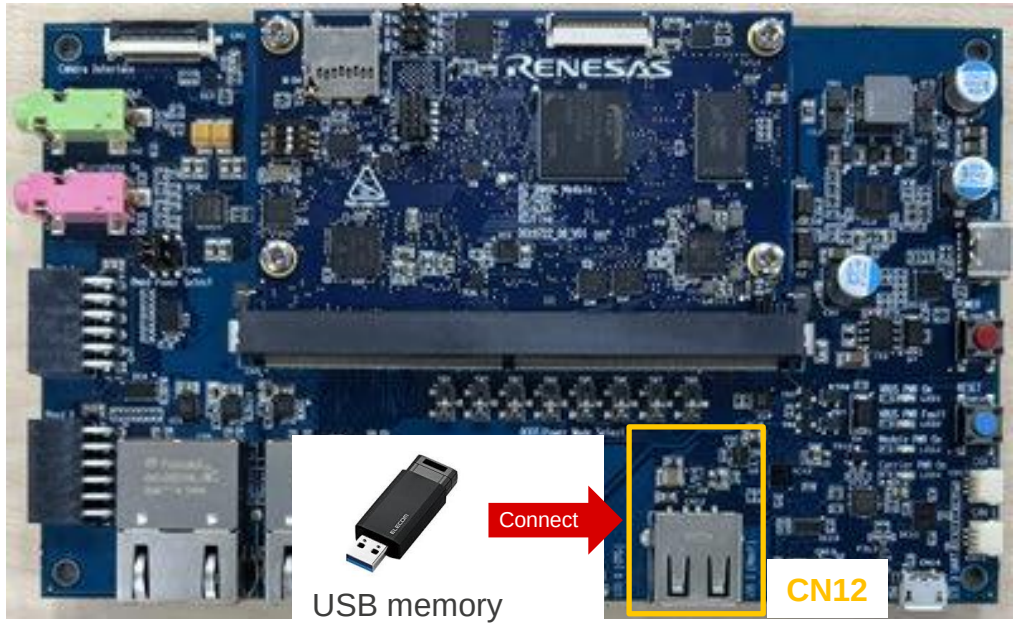
# Sample 6: usbx_demo_hmsc_rza3_fsp

This sample project creates, reads and writes files to the connected USB memory.

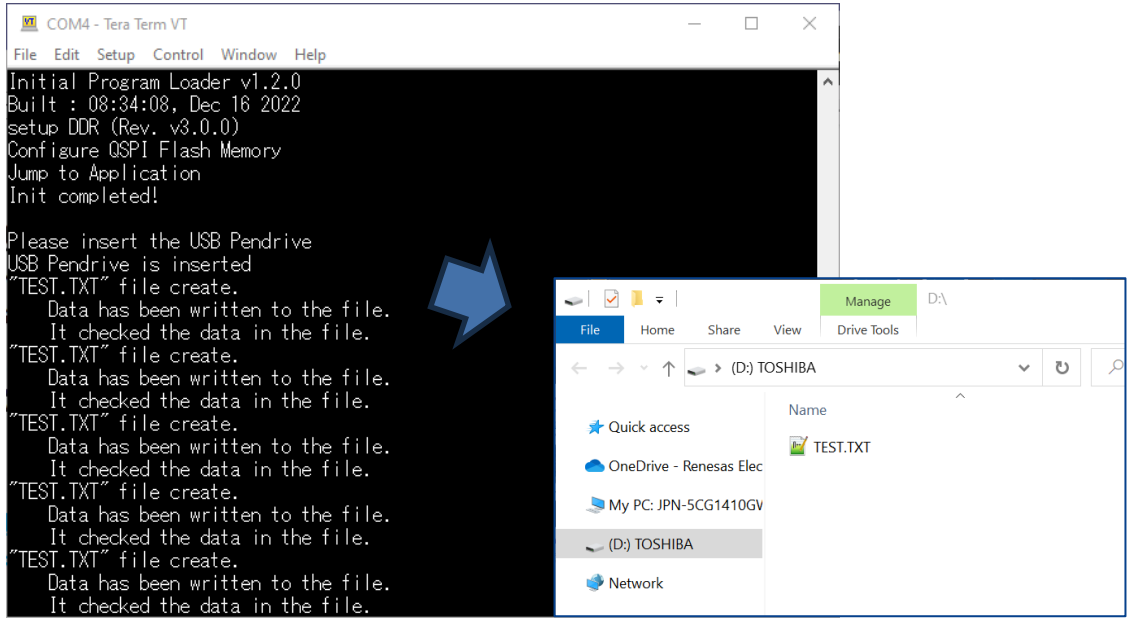
## How to Execute The Sample Project

1. Download the project and start debugging.
2. Connect the USB memory to the board.
3. Confirm that following information of the files in the connected USB memory is displayed on the terminal.

### Board Setting




### Message on Terminal



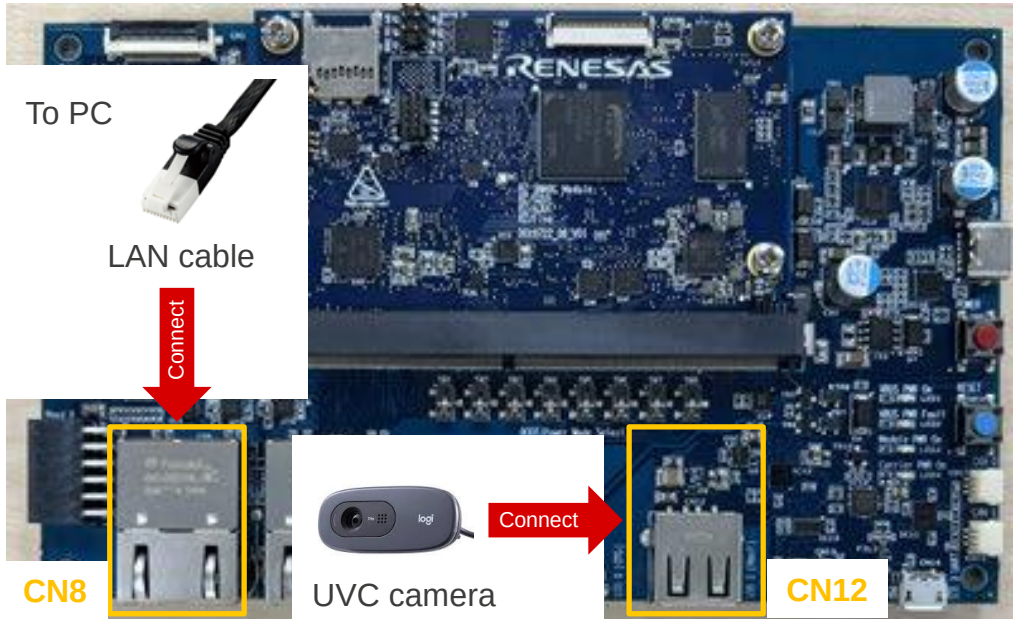
# Sample 7: usbx_demo_huvc_netx_http_server_rza3_fsp

This sample project displays the camera image on the HTTP server in real time.(Note)

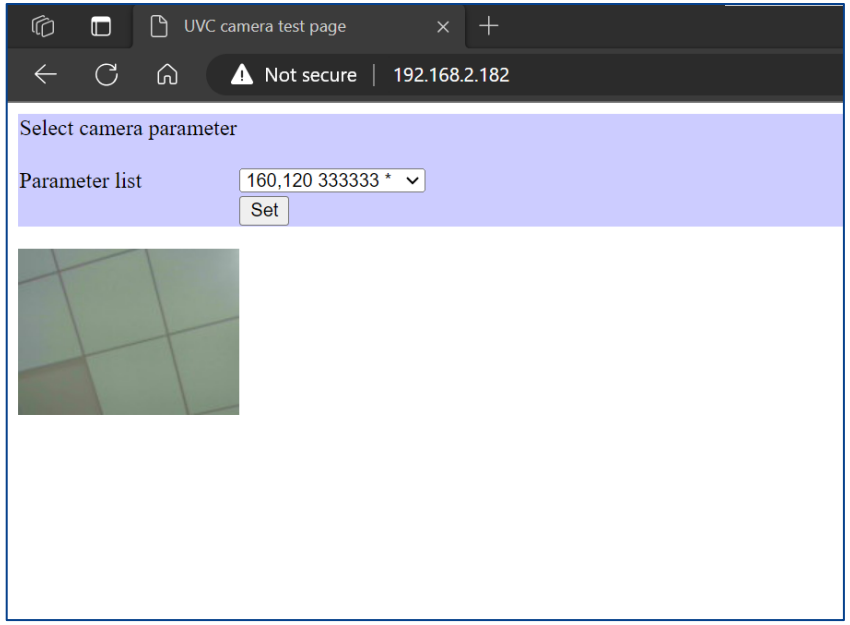
## How to Execute The Sample Project

1. Connect the Ethernet connector of the PC and the board.
2. Connect the UVC camera to the board.
3. Configure a static IP address (refer to *)
4. Download the project and start debugging.
5. Access the IP address “192.168.2.182” and confirm that camera image is displayed in the browser.

### Board Setting




### Browser Display



# Sample 7: usbx_demo_huvc_netx_http_server_rza3_fsp (Note)

Due to the bug of FSP, **the following files must be modified** to execute this sample project.
(They have been already modified for the released project.)

**ux_hcd_ehci_request_isochronous_transfer.c**

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**Before**

```
if (request_list == UX_NULL)
{
 /* Link to head. */
 (*head) = transfer_request;
 (*tail) = transfer_request;
 (*first_new) = transfer_request;
}
else
{
 /* Link to tail of the list. */
 (*tail) -> ux_transfer_request_next_transfer_request = transfer_request;
 /* In case there is nothing to load, set new ones. */
 if (*first_new == UX_NULL)
 *first_new = transfer_request;
}
/* Move tail until it's real last one. */



while((*tail) -> ux_transfer_request_next_transfer_request != UX_NULL)
     (*tail) = ((*tail) -> ux_transfer_request_next_transfer_request);
```

**After**

```
if (request_list == UX_NULL)
{
 /* Link to head. */
 ((*(ULONG*)head)) = (ULONG)transfer_request;
 ((*(ULONG*)tail)) = (ULONG)transfer_request;
 ((*(ULONG*)first_new)) = (ULONG)transfer_request;
}
else
{
 /* Link to tail of the list. */
 ((UX_TRANSFER*)(*(ULONG*)tail)) -> ux_transfer_request_next_transfer_request = transfer_request;
 /* In case there is nothing to load, set new ones. */
 if ((*(ULONG*)first_new) == UX_NULL)
    (*(ULONG*)first_new) = (ULONG)transfer_request;
}
/* Move tail until it's real last one. */
#if 1
while(((UX_TRANSFER*)(*(ULONG*)tail)) -> ux_transfer_request_next_transfer_request != UX_NULL)
    ((*(ULONG*)tail)) = (ULONG)(((UX_TRANSFER*)(*(ULONG*)tail)) -> ux_transfer_request_next_transfer_request);
#else
while((*tail) -> ux_transfer_request_next_transfer_request != UX_NULL)
    (*tail) = ((*tail) -> ux_transfer_request_next_transfer_request);
#endif
```

**ux_hcd_ohci_periodic_tree_create.c**

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**Before**

```
UX_OHCI_ED *ed_list[32];
UX_OHCI_ED *ed_start_list[32];
```

```
ed_list[current_list_entry * 2] -> ux_ohci_ed_next_ed
                                = ux_utility_physical_address(ed);
ed_list[(current_list_entry * 2) + 1] -> ux_ohci_ed_next_ed
                                      = _ux_utility_physical_address(ed);
```

**After**

```
ULONG ed_list[32];
ULONG ed_start_list[32];
```

```
((UX_OHCI_ED*)(ed_list[current_list_entry * 2])) -> ux_ohci_ed_next_ed
                                                 = _ux_utility_physical_address(ed);
((UX_OHCI_ED*)(ed_list[(current_list_entry * 2) + 1])) -> ux_ohci_ed_next_ed
                                                       = _ux_utility_physical_address(ed);
```

# Sample 8: RZA3UL_demo_azure_iot

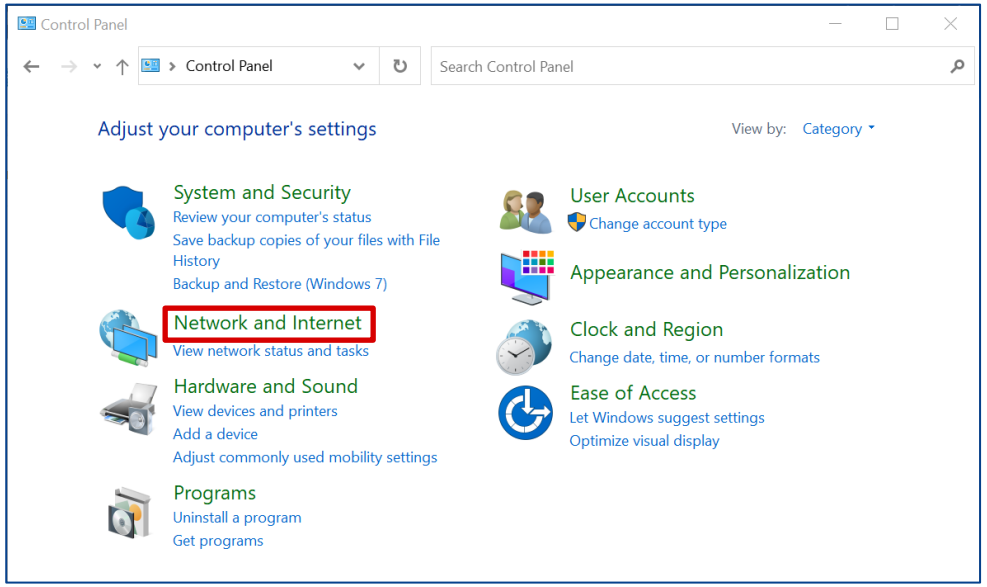
This sample project connects to Azure IoT Hub using Azure IoT Middleware for Azure RTOS. It supports IoT Plug and Play with multiple components.

### How to Execute The Sample Project

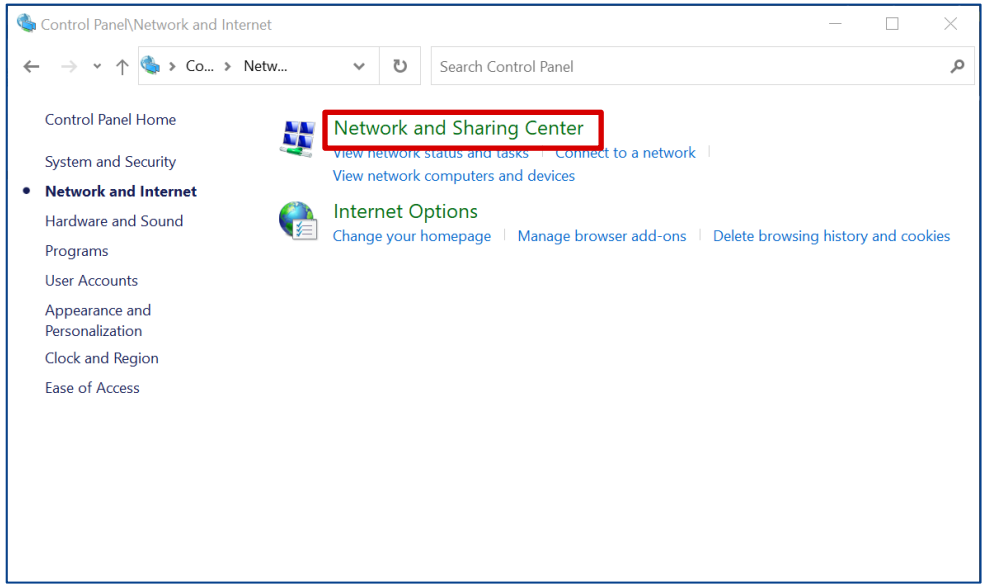
Please refer to following document.
rza3_gcc_azure_rtos_examples/DOCS/rza3ul_evk_plug-and-play.pdf at main · renesas-rz/rza3_gcc_azure_rtos_examples (github.com)

# Configuration of Static IP Address(1/3)

Configure the static IP address refer to the following procedure.



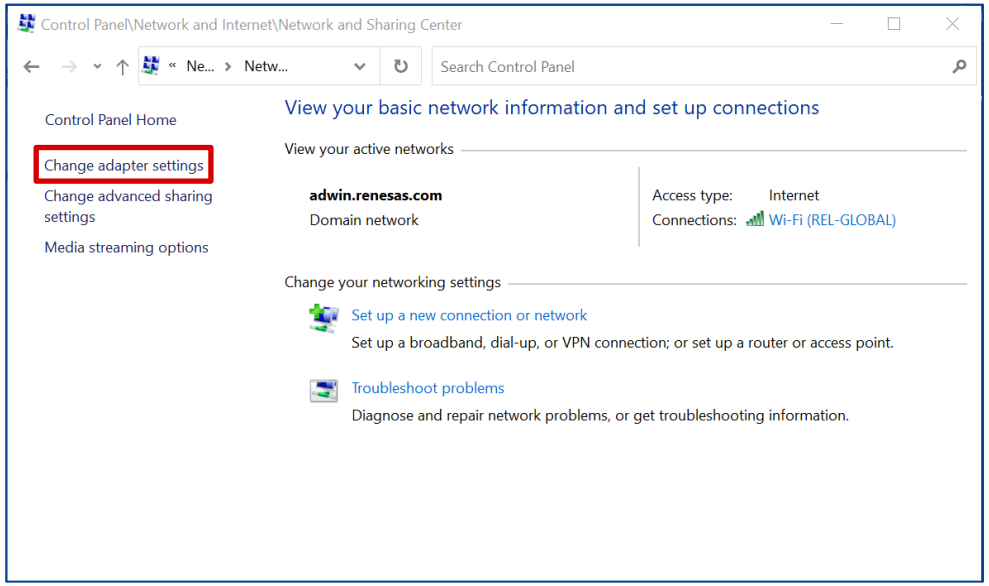

1. “Control Panel”
2. “Network and Internet”



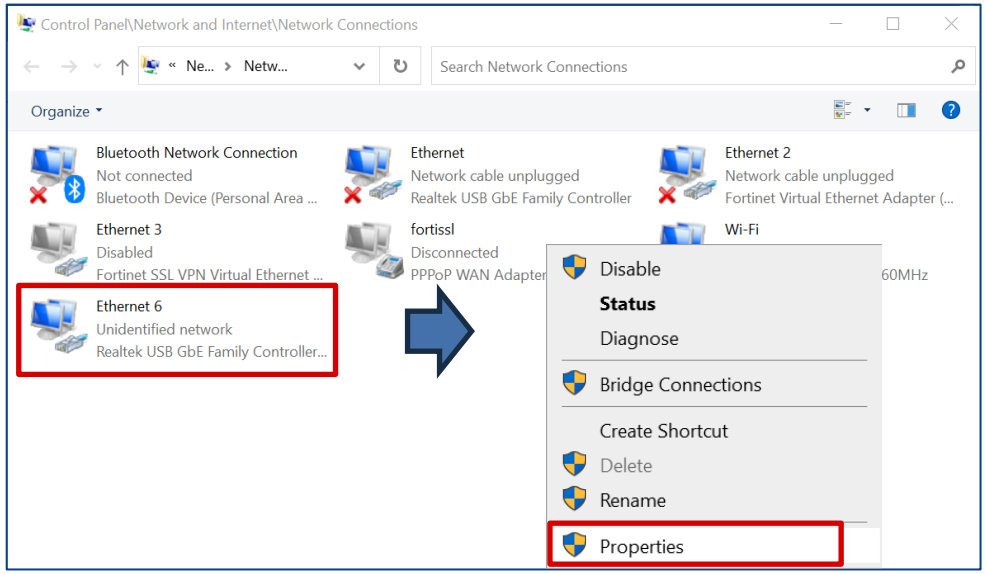

3. “Network and Sharing Center”

# Configuration of Static IP Address(2/3)

Configure the static IP address refer to the following procedure.



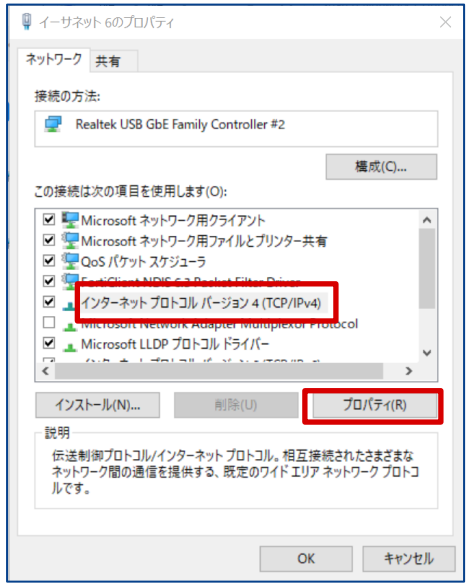

4. “Change adapter setting”



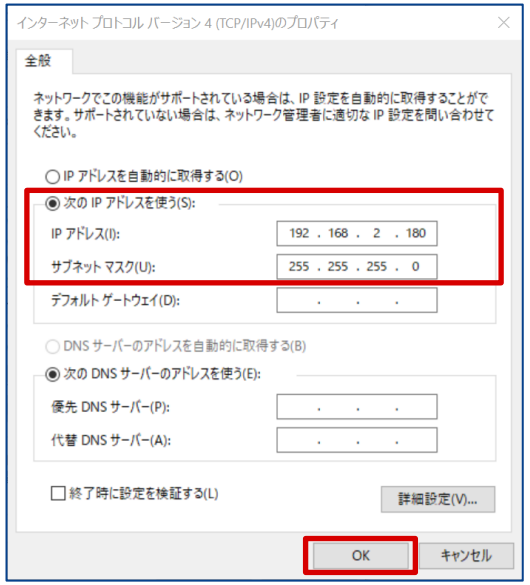

5. Right click the corresponding ethernet.
   * The one that changed state when the board was connected.
6. “Properties”

# Configuration of Static IP Address(3/3)

Configure the static IP address refer to the following procedure.




7. “Internet Protocol Version 4(TCP/IPv4)”
8. “Property(プロパティ)”




9. IP address(IP アドレス) → 192:168.2.180
   Subnet mask(サブネットマスク) → 255:255:255:0
10. “OK”

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